TASK 2:

```python
import pandas as pd

from sklearn.metrics.pairwise import cosine_similarity


# Mount Google Drive (if needed)

from google.colab import drive

drive.mount('/content/drive')


# Load the datasets (update paths if necessary)

customers = pd.read_csv('Customers.csv')

products = pd.read_csv('Products.csv')

transactions = pd.read_csv('Transactions.csv')


# --- Data Preparation ---


# 1. Create a customer-product matrix

customer_product_matrix = pd.pivot_table(

    transactions,

    values='Quantity',

    index='CustomerID',

    columns='ProductID',

    fill_value=0

)


# 2. Calculate cosine similarity

similarity_matrix = cosine_similarity(customer_product_matrix)
```

```python
# --- Lookalike Model ---

def get_lookalikes(customer_id, top_n=3):
    """
    Recommends similar customers based on cosine similarity.

    Args:
        customer_id: The ID of the target customer.
        top_n: The number of lookalikes to recommend.

    Returns:
        A list of tuples: [(lookalike_customer_id, similarity_score), ...].
    """
    customer_index = customers[customers['CustomerID'] == customer_id].index[0]
    similarities = similarity_matrix[customer_index]
    similar_indices = similarities.argsort()[-top_n-1:-1][::-1]  # Exclude self
    lookalikes = [(customers.iloc[i]['CustomerID'], similarities[i]) for i in similar_indices]
    return lookalikes

# --- Generate Lookalike Recommendations ---

lookalike_map = {}
target_customers = customers['CustomerID'][:20]  # First 20 customers

for customer_id in target_customers:
    lookalikes = get_lookalikes(customer_id)
    lookalike_map[customer_id] = lookalikes
```

```python
# --- Create Lookalike.csv ---

lookalike_df = pd.DataFrame.from_dict(lookalike_map, orient='index')

lookalike_df.to_csv('Lookalike.csv', index=True)
```